

Separation of colors and scents from candle wax

Pure C-815: separation of compounds by normal phase flash chromatography

1. Introduction

The aim of this short note was to separate paraffin, the main constituent of candle wax, from additives such as colorants and scents. Using preparative chromatography, this separation could be achieved quickly and with a high recovery of paraffin.

2. Experimental



Figure 1: Pure C-815 Flash chromatography system.

2 g of wax were dissolved in 10 mL of hexane. The obtained sample was directly injected on the Pure system. The run was performed according to the parameters listed in table 1 using a Reveleris® 12 g Silica cartridge.

Parameters	
Flow rate	30 mL/min
Equilibration time	3 min
Solvents	Hexane, Ethyl Acetate
UV Wavelengths	254 nm, 280 nm, 350 nm
Sensitivity	High
UV Threshold	0.05 AU
ELSD Threshold	50 mV
Sensitivity	High
Injection type	Liquid

Table 1: Parameters for the chromatographic separation

Time / min	Segment type	Ethyl acetate percentage
0-1	Isocratic hold	0 %
1-6	Gradient	0-100 %
6-7	Isocratic hold	100 %

Table 2: Gradient used in the separation.

3. Results

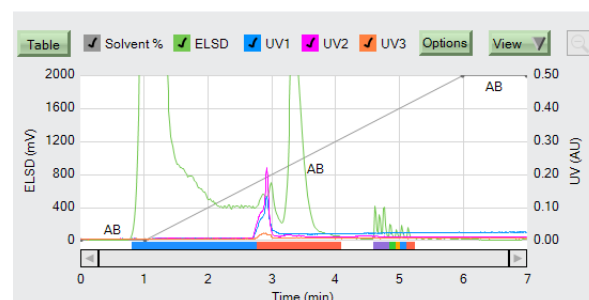


Figure 2: Chromatogram obtained from the separation of scents and colorants from candle wax.

Figure 2 shows the chromatogram obtained from the chromatographic separation. There is a strong peak in the ELSD from 1-2 minutes without any corresponding signal in the UV detector. This signal is assigned to the paraffin which does not significantly absorb at the measured wavelengths. The fractions eluted at $t=3-4$ min contain the orange coloring in the paraffin, which is confirmed by the color of the eluted sample, as well as some of the added scents.



Figure 3: The orange colorant is clearly visible on the cartridge.

Before the elution of this peak, the progress of the colorant through the column can be observed by eye (Figure 4). Several smaller peaks eluted around $t=5$ min have detectable signals in the ELSD but no visible UV absorption. These peaks contain the remaining scents added to the candle. After collection of the paraffin fractions and evaporation of hexane in a Rotavapor®, uncolored paraffin can be recovered in the evaporation flask almost quantitatively.

4. Conclusion

This Short Note shows how normal phase flash chromatography can be used to separate the main components of a colored and scented candle. The combination of ELSD and UV/VIS detection was crucial for the recovery and identification of all compounds in the experiment.